

## COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *durations* of effective sunshine whence the duration relative to possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have no necessary relation to each other, since stationary banks of clouds may obscure the sun without covering the sky, but when all clouds have a steady motion past the sun and are uniformly scattered over the sky, the percentages of duration and of area agree closely. For the sake of comparison, these percentages have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental records of percentages of durations of sunshine are almost always larger than the observers' personal estimates of percentages of area of clear sky; the average excess for September, 1896, is 7 per cent for photographic and 8 per cent for thermometric records.

The details are shown in the following table, in which the stations are arranged according to the greatest possible duration of sunshine, and not according to the *observed* duration as heretofore.

## ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table X, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

*Thunderstorms.*—The dates on which reports of thunderstorms for the whole country were most numerous were: 3d, 208; 5th, 136; 12th, 147; 17th, 138; 18th, 150; 19th, 247.

Thunderstorm reports were most numerous in: Florida, 111; Illinois, 157; Massachusetts, 102; Missouri, 238; North Carolina, 127; Ohio, 109; Pennsylvania, 105.

Thunderstorm were most frequent in: Florida, 26 days; Illinois, 20; Missouri, 25; North Carolina and Texas, 21.

*Auroras.*—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 17th to the 25th, inclusive. On the remaining twenty-one days of this month 35 reports were received, or an average of about 1.5 per day. The date on which the number of reports especially exceeded this average were: 4th, 7; 18th, 9; 30th, 10.

Auroras were reported by a large percentage of observers, in Minnesota and New Hampshire, 22; North Dakota, 26 per cent.

Auroras were reported most frequently in: Minnesota, 11 days; North Dakota, 6.

## CANADIAN REPORTS.

*Thunderstorms* were reported as follows: Yarmouth, 17th, 19th, 20th; Montreal, 17th; Toronto, 27th; Port Stanley, 5th; Saugeen, 6th; Port Arthur, 9th.

*Auroras* were reported as follows: Father Point, 12th, 15th; Quebec, 3d, 4th, 15th; Toronto, 19th; Port Arthur, 13th, 16th; Winnipeg, 3d, 13th, 15th, 22d, 30th; Minnedosa, 1st, 2d, 6th; Medicine Hat, 30th; Prince Albert, 2d; Edmonton, 3d, 6th.

## INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers for the current month are given in Table VIII, from which it appears that the only case in which a river exceeded danger line was that of the James River, at Lynchburg, Va., which had risen 0.2 feet above danger line on the 30th, in consequence of the heavy rains that had fallen the day before in connection with the hurricane in that region. These rains were heaviest in the mountainous parts of western Virginia, Maryland, and central Pennsylvania. In general, the rivers maintained a very uniform stage of water; the greatest ranges during the month were: 9.4 at Chattanooga, and 8.4 at Kansas City and Cairo.

## CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective services.

Snowfall and rainfall are expressed in inches.

*Alabama.*—The mean temperature was 75.8°, or 0.7° above normal; the highest was 104°, at Ashville on the 18th, and the lowest, 35°, at Healing Springs and Pineapple on the 30th. The average precipitation was 1.76, or 0.98 below normal; the greatest monthly amount, 3.95, occurred at Rock Mills; no rain fell at Pineapple. The drought which began during the second decade of July, over the central and northern portions of the State, and which was practically unbroken during August, continued with very little exception until the last decade of September, when it was partially broken by scattered, and in some places heavy, showers; but in some portions, notably in Wilcox and adjoining counties, the drought continued throughout the month. The effect of the weather on growing crops was a continuation of that reported for August; all late summer crops were either prematurely forced or entirely checked; in both cases there resulted inferior yields. Cotton was nearly all gathered in by the end of the month, closing a phenomenally early cotton season in this State.

*Arizona.*—Report not received.

*Arkansas.*—The mean temperature was 73.3°, or 0.4° above normal; the highest was 106°, at Hot Springs and Prescott on the 17th, and the lowest, 35°, at Corning on the 22d, La Crosse, Keesees Ferry, and Brinkley on the 29th, and Witts Springs on the 27th and 28th. The average precipitation was 3.25, or 0.19 above normal; the greatest monthly amount, 5.07, occurred at Moore, and the least, 0.69, at Gaines Landing.

*California.*—The mean temperature was 67.9°, or 1.9° below normal; the highest was 118°, at Volcano Springs on the 15th, and the lowest, 18°, at Bodie on the 19th. The average precipitation was 0.37, or 0.16

above normal; the greatest monthly amount, 2.29, occurred at Laporte, while no rain fell at numerous stations.

*Colorado.*—The mean temperature was 57.4°, or about 1.0° below normal; the highest was 104°, at Lamar on the 1st, and the lowest, 9.0° at Breckenridge on the 28th. The average precipitation was 2.04, or 1.13 above normal; the greatest monthly amount, 5.14, occurred at T. S. Ranch, and the least, 0.15, at Lajara.

*Florida.*—The mean temperature was 79.5°, or 4.2° above normal; the highest was 100°, at McClenny on the 13th, and the lowest, 48°, at Milton on the 30th. The average precipitation was 4.42, or 0.55 below normal; the greatest monthly amount, 11.12, occurred at Myers, and the least, 0.70, at McClenny. The climatic features of the month were generally abnormal, as indicated by excessive heat and deficiency in precipitation. The drought which began to be seriously felt as early as July still influences the conditions over the greater portion of the State, and its ill effects are evident in the rapidly maturing crops. Cotton opened before maturing, hastened by dry weather and constant sunshine. Though staple crops, such as corn, cotton, and potatoes have been injured, and a reduced production conceded, September has been an ideal month for harvesting. No generally excessive rains prevailed, and all cotton housed was in an excellent condition. A decided departure from these satisfactory conditions took place on the 29th, when a West India hurricane passed over portions of the State. Approaching the coast near Cedar Keys on the morning of the 29th, it pursued a north-northeasterly course through Levy, Lafayette, Alachua, Bradford, Suwannee, Columbia, Baker, and Nassau counties, leaving death and destruction in its wake. The center of the storm passed through portions of the above counties. The effect of the hurricane was felt over the entire northeast portions of the State. At least 50 lives were lost, and damage to the amount of \$3,000,000 was the result. Continued dry weather has retarded the growth of plants, and has largely operated to delay sowing over the greater portion of the State. Citrus

trees did very well, and the fruit interests in the southern portion of the State are satisfactory. Over a limited section excessive rains and dry weather alternated, causing some fruit to split.

**Georgia.**—The average temperature was 76.3°, or 3.0° above the normal; the highest was 107°, at Milton on the 19th, and the lowest, 35°, at Diamond on the 24th. The average precipitation was 2.37, or 1.77 below normal; the greatest monthly amount, 9.59, occurred at Clayton; no rain fell at Monticello.

**Idaho.**—The mean temperature was 55.5°, or 2.2° above normal; the highest was 101°, at Payette on the 1st, and the lowest, 10°, at Chesterfield on the 27th. The average precipitation was 0.54, or 0.90 below normal; the greatest monthly amount, 1.71, occurred at Warren, and the least, "trace," at Burnside and Downey.

**Illinois.**—The mean temperature was 62.9°, or 2.8° below normal; the highest was 100°, at Plumbill on the 11th and Mascoutah on the 13th, and the lowest, 27°, at Lanark on the 20th. The average precipitation was 5.46, or 1.41 above normal; the greatest monthly amount, 14.44, occurred at St. Charles, and the least, 1.76, at Muddy Valley.

**Indiana.**—The mean temperature was 63.7°, or 1.8° below normal; the highest was 100°, at Mount Vernon on the 12th, 13th, and 14th; the lowest was 28°, at Angola, Auburn, and Bluffton on the 23d. The average precipitation was 5.02, or 1.82 above normal; the greatest monthly amount, 8.17, occurred at Indianapolis, and the least, 2.13, at Edwardsville.

**Iowa.**—The mean temperature was 58.5°, or 3.5° below normal; the highest was 95°, at Bonaparte on the 2d and Malvern on the 8th, and the lowest, 22°, at Mason City on the 27th. The average precipitation was 4.09, or 0.39 above normal; the greatest monthly amount, 9.96, occurred at Moor, and the least, 1.82, at Iowa City.

**Kansas.**—The mean temperature was 65.8°, or 2.9° below normal; the highest was 108°, at Medicine Lodge on the 7th, and the lowest, 28°, at Englewood on the 27th. The average precipitation was 2.99, or 0.61 above normal; the greatest monthly amount, 6.44, occurred at Hutchinson, and the least, 0.77, at Meade.

**Kentucky.**—The mean temperature was 68.6°, or 0.8° below normal; the highest was 100°, at Paducah on the 17th, and the lowest, 30°, at Lola and Pleasant Ridge Park on the 24th. The average precipitation was 3.77, or 0.83 above normal; the greatest monthly amount, 6.17, occurred at Fords Ferry, and the least, 1.79, at Middlesboro.

**Louisiana.**—The mean temperature was 81.8°, or 0.7° above normal; the highest was 105°, at Oakridge on the 12th, 13th, 17th, and 18th, and the lowest, 36°, at Robeline on the 25th. The average precipitation was 3.30, or 0.35 above normal; the greatest monthly amount, 10.69, occurred at Port Eads, and the least, 0.46, at Abbeville.

**Maryland.**—The mean temperature was 66.6°, or 0.6° above normal; the highest was 98°, at Taneytown on the 11th, and the lowest, 29°, at Deer Park on the 24th. The average precipitation was 4.33, or 0.73 above normal; the greatest monthly amount, 8.07, occurred at Flintstone, and the least, 1.13, at Milford, Del. The storm of the 29th, though very severe, was not generally as destructive in this State as in those lying to the southward.

**Michigan.**—The mean temperature was 56.4°, or 3.9° below normal; the highest was 94°, at Waverly on the 4th, and the lowest, 7°, at Newberry on the 9th. The average precipitation was 5.10, or 2.51 above normal; the greatest monthly amount, 8.32, occurred at Kalamazoo, and the least, 1.05, at Baraga.

**Minnesota.**—The mean temperature was 54.3°; the highest was 97°, at Beardsley on the 7th, and the lowest, 16°, at Lakeside on the 18th. The average precipitation was 2.49; the greatest monthly amount, 4.75, occurred at Worthington, and the least, "trace," at Maplewood.

**Mississippi.**—The mean temperature was 75.4°, or 1.0° above normal; the highest was 103°, at Yazoo City on the 18th, and the lowest, 33°, at French Camp on the 29th. The average precipitation was 1.45, or 2.36 below normal; the greatest monthly amount, 56.4, occurred at Magnolia, and the least, 0.20, at Natchez.

**Missouri.**—The mean temperature was 64.9°, or 2.9° below normal; the highest was 101°, at Zeitonia on the 18th, and the lowest, 28°, at Potosi on the 23d. The average precipitation was 4.23, or 0.91 above normal; the greatest monthly amount, 8.17, occurred at Sublett, and the least, 1.65, at Jefferson City. In a number of the northern counties cool, cloudy weather, with frequent showers, considerably retarded the ripening of late corn, but in other sections practically the entire crop was out of danger from frost by the 20th. The frequent rains in the northern counties greatly delayed wheat sowing, but in many of the central and southern counties the work progressed very slowly during the first part of the month owing to drought, but good rains in the latter sections on the 19th, 20th, and 21st put the ground in much better condition, and by the close of the month seeding was generally well advanced and the early-sown wheat was up and growing finely. Fall pastures, at the close of the month, were reported dry and short in a few localities, but as a rule were in good condition.

**Montana.**—The mean temperature was 52.0°, or 3.0° below normal; the highest was 95°, at Radersburg on the 1st, and the lowest, 13°, at Lewiston on the 9th. The average precipitation was 1.98, or 0.91 above normal; the greatest monthly amount, 6.02, occurred at Kipp, and the least, 0.15, at Poplar.

**Nebraska.**—The mean temperature was 59.8°, or 3.6° below normal;

the highest was 102°, at Norman on the 8th, and the lowest, 16°, at Springview on the 19th. The average precipitation was 2.37, or 0.53 above normal; the greatest monthly amount, 5.90, occurred at Strang, and the least, 0.72, at Dunning.

**Nevada.**—The mean temperature was 58.3°, or 2.0° below normal; the highest was 102°, at St. Thomas on the 16th, and the lowest, 15°, at Stofield on the 10th and 27th. The average precipitation was 0.35, or 0.01 above normal; the greatest monthly amount, 1.15, occurred at Palmetto; no precipitation fell at Battle Mountain, Mill City, or St. Thomas.

**New England.**—The mean temperature was 59.0°; the highest was 96°, at Stratford, N. H., on the 12th; the lowest, 24°, at Fort Fairfield, Me., on the 24th and Flagstaff, Me., on the 29th. The average precipitation was 6.16; the greatest monthly amount, 10.32, occurred at Belfast, Me., and the least, 2.06, at Nantucket, Mass.

**New Jersey.**—The mean temperature was 65.1°, or 0.6° above normal; the highest was 95°, at Belvidere and Somerville on the 11th; the lowest, 30°, at Woodbine on the 24th. The average precipitation was 4.37, or 0.48 above normal; the greatest monthly amount, 8.77, occurred at Charlotteburg, and the least, 2.26, at Atlantic City.

**New Mexico.**—The mean temperature was about normal; the highest was 99°, at Eddy on the 3d, and the lowest, 20°, at Buckmans on the 27th. The average precipitation was above normal, and was fairly well distributed; the greatest monthly amount, 4.40, at Albert, and the least, 0.72, at Albuquerque.

**New York.**—The mean temperature was 59.7°, or 1.5° below normal; the highest was 97°, at Waverly on the 11th, and the lowest, 25°, at Canton and Number Four on the 23d. The average precipitation was 4.16, or 0.93 above normal; the greatest monthly amount, 7.42, occurred at Elko Park, and the least, 1.97, at Brookfield.

**North Carolina.**—The mean temperature was 70.3°, the normal for the month; the highest was 102°, at South Pines on the 18th, and the lowest, 30°, at Linville on the 24th. The average precipitation was 5.31, or 0.77 above normal; the greatest monthly amount, 9.57, occurred at Oakridge, and the least, 1.80, at Selma.

**North Dakota.**—The mean temperature was 53.0°, or 3.0° below normal; the highest was 98°, at Fort Yates on the 8th, and the lowest, 11°, at Willow City on the 27th. The average precipitation was 1.83, or 0.13 below normal; the greatest monthly amount, 3.59, occurred at Gallatin, and the least, 0.12, at Berthold Agency.

**Ohio.**—The mean temperature was 62.7°, or 2.0° above normal; the highest was 100°, at Cardington on the 11th, and the lowest, 26°, at Hedges on the 23d. The average precipitation was 5.13, or 2.13 above normal; the greatest monthly amount, 8.11, occurred at Pataskala, and the least, 2.49, at Pomeroy. Very heavy rainfalls were experienced from the 27th to the 30th, and much damage resulted to crops and farm and city property by floods and washouts.

**Oklahoma.**—The mean temperature was 72.8°; the highest was 107°, at Anadarko on the 7th, and the lowest, 29°, at Beaver on the 28th. The average precipitation was 2.19; the greatest monthly amount, 4.17, occurred at Pond Creek, and the least, 0.97, at Healdton.

**Oregon.**—The mean temperature was 58.1°, or 0.3° below normal; the temperature was deficient in the western portion, but was in excess in the eastern portion. The average precipitation was 1.02, or 0.96 below normal; the greatest monthly amount, 5.13, occurred at Nehalem.

**Pennsylvania.**—The mean temperature was 63.6°, or 0.1° below normal; the highest was 98°, at Honesdale on the 11th and Irwin on the 12th, and the lowest, 26°, at Shinglehouse on the 23d. The average precipitation was 4.82, or 1.04 above normal; the greatest monthly amount, 8.57, occurred at Browsers Lock, and the least, 1.73, at Cannonsburg. The interior portion of the State was visited by the tropical cyclone of the 29th and 30th. The newspapers estimate the resulting damages at about \$2,000,000 dollars. The Pennsylvania Railroad bridge, over a mile in length, across the Susquehanna River at Columbia, was completely demolished and swept from its piers. A conservative estimate of the damage in York County places it at \$300,000.

**South Carolina.**—The mean temperature was 75.0°, or 0.9° above normal; the highest was 105°, at Little Mountain and Shaws Forks on the 18th, and the lowest, 39°, at Allendale and Florence on the 24th. The average precipitation was 2.94, or 2.00 below normal; the greatest monthly amount, 8.06, occurred at Central, and the least, 0.50, at Shaws Forks. On the 29th a severe storm crossed the State from south to north, the path of the storm was from Hampton due north to Lancaster County. It exhibited destructive violence in Beaufort, Hampton, Berkeley, Clarendon, Sumter, Darlington, and Chesterfield counties, with much injury to buildings, open cotton, and forest trees. There were a number of fatalities in Beaufort County. The wind reached velocities estimated at from 75 to 100 miles per hour. The storm had a rapid progressive movement, traveling across the State in not quite four hours, or at the rate of about 53 miles per hour.

**South Dakota.**—The mean temperature was 57.6°, or 1.5° below normal; the highest was 102°, at Nowlin on the 7th, and the lowest, 15°, at Shiloh on the 19th. The average precipitation was 2.34, or 0.93 above normal; the greatest monthly amount, 5.43, occurred at Howard, and the least, 0.45, at Edgemont.

**Tennessee.**—The mean temperature was 69.8°, or about normal; the highest was 101°, at Bolivar on the 17th, and the lowest, 34°, at Hohen-

wald and St. Joseph on the 24th. The average precipitation was 3.41, or 0.25 above normal; the greatest monthly amount, 6.50, occurred at Brownsville, and the least, 0.29, at Pope. The lack of sufficient rainfall during the first half of the month was quite seriously felt by late and unmaturing crops, and it delayed the preparation of the soil for fall seedings, but otherwise conditions favored the gathering, in good condition, of those crops that were maturing.

*Texas.*—The mean temperature was  $0.9^{\circ}$  above normal; there was a general excess, except over the Panhandle and the extreme eastern portion of the coast district, where it ranged from about normal to  $4^{\circ}$  below, with the greatest deficiency in the vicinity of Amarillo. The excess in temperature ranged from  $0.3^{\circ}$  to  $1.4^{\circ}$  over north and west Texas and the central and west coast district, from  $1.5^{\circ}$  to  $2^{\circ}$  over central and southwest Texas, and from  $2.1^{\circ}$  to  $3.8^{\circ}$  over east Texas, with the greatest excess in the vicinity of Palestine. The maximum was  $110^{\circ}$ , at Mann on the 5th, and the minimum,  $33^{\circ}$ , at Mount Blanco on the 28th. The average precipitation was 1.13 above normal. There was a general excess, except along the immediate coast and over the eastern and central portions of north Texas, where there was a deficiency ranging from 0.01 to 4.01, with the greatest in the vicinity of Galveston. The excess ranged from 0.08 to 1.24 over west Texas, the Panhandle, the western portion of north and central Texas, and the eastern portion of east Texas, and from 1.22 to 6.03 over southwest Texas, the eastern portion of central Texas, and the western portion of east Texas; the greatest excess was in the vicinity of Hearne and Golindo. The precipitation was not well distributed during the month, there being almost a total absence during the first and second decades and general excessive rains during the third decade, especially over the central portions of the State.

*Utah.*—The mean temperature was  $61.0^{\circ}$ , or about  $3.0^{\circ}$  below normal; the highest was  $100^{\circ}$ , at Manti on the 3d and St. George on the 4th, and the lowest,  $16^{\circ}$ , at Richfield on the 27th. The average precipitation was 1.00, or slightly above normal; the greatest monthly amount, 5.97, occurred at Moab, and the least, 0.12, at St. George.

*Virginia.*—The mean temperature was  $67.9^{\circ}$ , or  $0.1^{\circ}$  above normal; the highest was  $99^{\circ}$ , at Petersburg on the 18th, and the lowest,  $20^{\circ}$ , at Guinea on the 24th. The average precipitation was 4.94, or 0.47 above normal; the greatest monthly amount, 8.47, occurred at Woodstock, and the least, 2.67, at Manassas. The predominant feature of the month was the West India hurricane which swept over the State on the night of the 29th. This storm, which had been traveling slowly northward from the Gulf of Mexico for several days prior to its passage across this section, seemed to concentrate its fury in Virginia, and left death and destruction in its wake. The area of greatest violence would

probably be comprised within a line run due north from Southampton County, on the east, and one run north by west from Mecklenburg County, on the west, comprising the central two-thirds of the State. In cities buildings were razed and unroofed, trees uprooted and broken, and, in some cases, lives lost, while in agricultural communities farm products, fodder, fencing, outbuildings, orchards, etc., were destroyed. The value of property lost will probably amount to over \$1,000,000. Phenomenal rains occurred over Augusta and adjoining counties, causing floods and washouts and loss of life and property.

*Washington.*—The mean temperature was  $56.4^{\circ}$ , or  $0.8^{\circ}$  below normal; the highest was  $98^{\circ}$ , at Fort Simcoe on the 6th, and the lowest,  $18^{\circ}$ , at Cascade Tunnel on the 16th. The average precipitation was 1.17, or 0.87 below normal; the greatest monthly amount, 2.80, occurred at Queets, and the least, 0.12, at Fort Simcoe.

*West Virginia.*—The mean temperature was  $65.2^{\circ}$ , or about normal; the highest was  $95^{\circ}$ , at Philippi on the 14th, and the lowest,  $22^{\circ}$ , at Beckly on the 22d. The average precipitation was 4.59, or 1.50 above normal; the greatest monthly amount, 9.04, occurred at Bloomery, and the least, 1.58, at Beckly. By far the greater part of the month's rain occurred on the 29th and 30th during the passage of the hurricane which swept the country from the Gulf to the northern boundary, and which caused such immense loss of property and several lives. Heavy rains fell in all sections of the State, the fall in the eastern portions being exceedingly heavy. Reports show a very considerable damage to property of various kinds and serious washouts on railroads. The observer at Martinsburg reports a terrible storm on the 29th. Trees were uprooted, houses and fences blown down, the streams rose suddenly and great damage was done to crops along the lowlands. The observer at Old Fields reports that the freshest of the 30th washed away a large amount of corn, hay, and clover seed, and some cattle, horses, and hogs were lost. The eastern and northern counties suffered most severely from this storm, the western portions receiving only heavy rains and moderately strong winds.

*Wisconsin.*—The mean temperature was  $55.9^{\circ}$ , or  $4.1^{\circ}$  above normal; the highest was  $90^{\circ}$ , at Racine on the 2d, and the lowest,  $19^{\circ}$ , at Amherst on the 20th. The average precipitation was 4.34, or 1.06 above normal; the greatest monthly amount, 9.58, occurred at Sharon, and the least, 1.27, at Bayfield.

*Wyoming.*—The mean temperature was  $54.1^{\circ}$ , or about  $4.0^{\circ}$  below normal; the highest was  $99^{\circ}$ , at Wheatland on the 6th, and the lowest,  $19^{\circ}$ , at Cheyenne on the 27th and Wise on the 26th. The average precipitation was 1.64, or about 0.90 above normal; the greatest monthly amount, 3.35, occurred at Sundance, and the least, 0.40, at Wheatland

## SPECIAL CONTRIBUTIONS.

### THE WIND-RUSH OF SEPTEMBER 29, 1896.

By Prof. H. A. HAZEN (dated October 2, 1896).

On the night of September 29 there occurred the most destructive storm that ever visited Washington, and it merits special study. The weather map at 8 p. m. shows a general storm with lowest pressure, 29.30 inches, at Lynchburg, Va. The lowest pressure at Washington, 29.14 inches, occurred at 10.50 p. m. The wind velocity continued very high from 10.55 to 11.48, and at times reached 70 miles per hour. The destructive wind had a general southerly direction, but came a little from the east on the east side of the city, and from the west on the west side. In Alexandria the wind was nearly southeast.

#### (a) WASHINGTON, D. C.

The most remarkable fact noted was that the destruction was in well marked streaks and not universal. In hundreds of instances a well constructed roof, rafters and all, was blown off, while close by very frail structures at the same height were uninjured. In some cases this effect was undoubtedly heightened by the formation of eddies in the streets, and by the reinforcement of the wind blowing along streets running north and south, but making due allowance for all such cases, there was the clearest evidence that there was not a steady blow over the whole region, but that there were streaks or wind-rushes at various points and along certain well-defined lines. There is also evidence to show that the wind did not bear a definite relation to the baric gradient, for it died down quite rapidly after the maximum period had passed, while the gradient continued for a much longer time.

At the Abert building on Pennsylvania avenue the west wall of the two top stories was blown out, and falling upon a low building it broke through the roof and killed one man. This building had been built very recently, and had not, up to that time, received the glass in either front (south) or back (north) windows, but these were covered with cotton cloth. The singular fact is that the cloth in the back windows was not disturbed. The east and west walls trended about  $20^{\circ}$  east of north and west of south, and the southeast wind struck them almost at right angles. It seems possible that the blow from the wind was so sudden that the west wall gave way and relieved the pressure before the cloth could be blown out of the back windows. Some have considered that possibly a vacuum on the back of this west wall would have caused a pressure even as high as 2,000 pounds to the square foot. It is known, however, that the utmost vacuum that could have been caused by the wind upon the plane surface would not produce a pressure greater than 8 or 10 pounds per square foot.

On K street, NW., between Thirty-first and Thirty-second streets, two walls were forced out under peculiar conditions. Both walls were on the east side of buildings with a hip roof, the ridge pole running east and west. The windows were all closed so that the pressure on the inside must have been insignificant. Each wall gave way under its roof, which remained intact. There could have been no sudden withdrawal of air pressure from the outside for the reason that the storm was moving north quite slowly, and there was no sudden or marked change in pressure. It seems possible that